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EXAMINER
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GRAYBILL, DAVID E

ART UNIT	PAPER NUMBER
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2894

NOTIFICATION DATE	DELIVERY MODE
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ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/538,857	<b>Applicant(s)</b> BROWN ET AL.	
	<b>Examiner</b> David E. Graybill	<b>Art Unit</b> 2894	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-47 and 123 is/are pending in the application.
- 4a) Of the above claim(s) 14-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 17-47 and 123 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

Applicant's election without traverse of group IV, claims 17-26 in the reply filed on 9-08-09 is acknowledged.

Any inconvenience to applicant as a result of the correctly perceived ambiguity and incompleteness of the restriction requirement tiled on 6-09-09 is sincerely regretted.

Group IV is more properly defined herein as including claims 17-21.

Applicant's assumption that claims 1 and 5 are generic is correct.

However, applicant's assumption that claims 2-4, 6-13, 27-47 and 123 are generic is incorrect.

Specifically, claims 2-4, 6-13, 27-47 and 123 are not generic because the invention of claims 2-4, 6-13, 27-47 and 123 requires material elements additional to those required by claims 17-21, and each of claims 17-21 do not require all the limitations of claims 2-4, 6-13, 27-47 and 123. See MPEP 806.04(d).

Similarly, claims 22-26 are not generic elected claims 17-21.

However, to continue to afford applicant the benefit of compact prosecution, claims 2-4, 6-13, 22-47 and 123 are herein examined with the elected invention including generic claims 1 and 5.

Claims 14-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no

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allowable generic or linking claim. Election was made **without** traverse in the reply filed on 9-08-09.

Amendments to the claims filed on or after July 30, 2003 must comply with 37 CFR 1.121(c) which states:

(c) *Claims*. Amendments to a claim must be made by rewriting the entire claim with all changes (e.g., additions and deletions) as indicated in this subsection, except when the claim is being canceled. Each amendment document that includes a change to an existing claim, cancellation of an existing claim or addition of a new claim, must include a complete listing of all claims ever presented, including the text of all pending and withdrawn claims, in the application. The claim listing, including the text of the claims, in the amendment document will serve to replace all prior versions of the claims, in the application. In the claim listing, the status of every claim must be indicated after its claim number by using one of the following identifiers in a parenthetical expression: (Original), (Currently amended), (Canceled), (Withdrawn), (Previously presented), (New), and (Not entered).

(1) *Claim listing*. All of the claims presented in a claim listing shall be presented in ascending numerical order. Consecutive claims having the same status of "canceled" or "not entered" may be aggregated into one statement (e.g., Claims 1–5 (canceled)). The claim listing shall commence on a separate sheet of the amendment document and the sheet(s) that contain the text of any part of the claims shall not contain any other part of the amendment.

(2) *When claim text with markings is required*. All claims being currently amended in an amendment paper shall be presented in the claim listing, indicate a status of "currently amended," and be submitted with markings to indicate the changes that have been made relative to the immediate prior version of the claims. The text of any added subject matter must be shown by underlining the added text. The text of any deleted matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived. Only claims having the status of "currently amended," or "withdrawn" if also being amended, shall include markings. If a withdrawn claim is currently amended, its status in the claim listing may be identified as "withdrawn—currently amended."

(3) *When claim text in clean version is required*. The text of all pending claims not being currently amended shall be presented in the claim listing in clean version, i.e., without any markings in the presentation of text. The presentation of a clean version of any claim having the status of

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"original," "withdrawn" or "previously presented" will constitute an assertion that it has not been changed relative to the immediate prior version, except to omit markings that may have been present in the immediate prior version of the claims of the status of "withdrawn" or "previously presented." Any claim added by amendment must be indicated with the status of "new" and presented in clean version, *i.e.*, without any underlining.

(4) *When claim text shall not be presented; canceling a claim.*

(i) No claim text shall be presented for any claim in the claim listing with the status of "canceled" or "not entered."

(ii) Cancellation of a claim shall be effected by an instruction to cancel a particular claim number. Identifying the status of a claim in the claim listing as "canceled" will constitute an instruction to cancel the claim.

(5) *Reinstatement of previously canceled claim.* A claim which was previously canceled may be reinstated only by adding the claim as a "new" claim with a new claim number.

The amendment to the claims filed on 3-11-09 does not comply with the requirements of 37 CFR 1.121(c), at least because the text of the claim 1, lines 5-6, deleted matter "first and second regions of the" is not shown.

Because the response appears to be bona fide, but through an apparent oversight or inadvertence the response is non-compliant, and in order to continue to afford applicant the benefit of compact prosecution, the requirement to comply with the response within a one month time limit is waived, the amendment is entered, and the claims are examined on the merits.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered:

Re claim 1: so as to confine in a single step the deposition of said conductive or semiconductive material to said first and second regions.

Re claim 6: a channel.

Re claim 35: both the semiconductor layer and the dielectric layer are patterned so as to form an active layer island of the device.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

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corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 43. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The amendment filed 3-11-09 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is the entire amendment.

In particular, there is no original disclosure of the particular structure shown in new Figure 1(G).

Applicant is required to cancel the new matter in the reply to this Office Action.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-13, 17-47 and 123 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There is insufficient antecedent basis for the following claim language:

Re claim 13: a high surface energy as the substrate.

The scope of the following language is unclear:

Re claim 1: so as to confine in a single step the deposition of said conductive or semiconductive material to said first and second regions.

Re claim 4: such that a raised region of the substrate has a width, as measured in a plane of the surface of the substrate, is dependent on a depth to which the embossing surface of the tool enters into the substrate.

Re claim 13: a polymer layer having a high surface energy as the substrate.

Re claim 26: a solution of an inorganic metal precursor.

The following is further clarified:



Re claim 1: so as to confine in a single step the deposition of said conductive or semiconductive material to said first and second regions.

In particular, it is unclear if or how the language, "in a single step" modifies the language "so as to confine" and/or the language, "the deposition of said conductive or semiconductive material."

Also, it is unclear if or how the language, "so as to confine in a single step" further limits the scope of the language, "the deposition of said conductive or semiconductive material."

Still further, if the language "in a single step" is intended to limit the claim to only one step, it is unclear what other steps are excluded by this negative limitation.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-13, 17-47 and 123 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The undescribed subject matter is the following:

Re claim 1: so as to confine in a single step the deposition of said conductive or semiconductive material to said first and second regions.

In particular, the language, "in a single step" is a negative limitation which excludes additional steps, and any negative limitation or exclusionary proviso must have basis in the original disclosure. See *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983) *aff'd mem.*, 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation or drawing illustration is not basis for an exclusion.

Claims 13 and 26 has/have not been rejected over the prior art because, in view of the 35 U.S.C. 112 rejections, there is a great deal of confusion and uncertainty as to the proper interpretation of the limitations of the claim(s); hence, it would not be proper to reject the claim(s) on the basis of prior art.

As stated in *In re Steele*, 305 F.2d 859, 134 USPQ 292 (CCPA 1962), a rejection should not be based on considerable speculation about the meaning of terms employed in a claim or assumptions that must be made as to the scope of the claims. Also see: *In re Wilson*, 424 F.2d 1382, 165 USPQ 494 (CCPA 1970) (if no reasonably definite meaning can be ascribed to certain claim language, the claim is indefinite, not obvious). See also MPEP 2143.03 and 2173.06. In *re STEELE, MILLS, AND LEIS*, 134 USPQ 292 (C.C.P.A. 1962), "Our analysis of the claims indicates that considerable speculation as to meaning of the terms employed and assumptions as to the scope of such claims were made by the examiner and the board. We do not think a rejection under 35 U.S.C. 103 should be based on such speculations and assumptions." *Ex parte Tanksley*, 26 USPQ2d 1384 (Bd. Pat. App. & Int., "it has been indicated in several prior decisions that claims may be too indefinite to be examined with respect to the prior art." *Ex parte Lyell*, 17 USPQ2d 1548 (Bd. Pat. App. & Int. 1990), "With regard to the examiner's rejection of appealed claims 2, 4, 7, 8 and 10 through 12 under 35 USC 102(b) as anticipated by Morawski, it is our view that since the appealed claims are

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indefinite and indeterminate in scope for the reasons stated *supra*, it is not possible to apply the prior art to these claims in deciding patentability without disregarding portions of the express wording of the claims and thus resorting to speculation and conjecture as to the particular invention defined therein. We therefore will not sustain the examiner's rejection of the appealed claims under 35 USC 102(b)." Ex parte Oetiker, 23 USPQ2d 1651 (Bd. Pat. App. & Int. 1990), "claims 2 through 9, 11, 13 and 19 contain additional indefinite language which precludes us from applying the prior art in determining the question of obviousness." Ex parte Brummer, 12 USPQ2d 1653 (Bd. Pat. App. & Int. 1989), "The examiner also has rejected the claims as being obvious in view of the bicycle disclosed by Mosconi. However, as set forth above, no reasonably definite meaning can be ascribed to certain language in claim 9 and, in such a case, the subject matter does not become obvious, the claim becomes indefinite." Ex parte LEWIN, 140 USPQ 70 (Bd. Pat. App. & Int. 1963). In re Merat and Cochez, 186 USPQ 471 (C.C.P.A. 1975).

In the rejections *infra*, generally, reference labels and other claim element identifiers are recited only for the first recitation of identical claim elements.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 2, 6-8, 11, 27, 30, 31, 36-38, 40, 43-47 and 123 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Bernds (WO0247183).

Bernds (WO0247183) (from English equivalent family member Berndts (20040063627)), discloses the following:

At paragraphs 2, 4-18 and 20-28, Berndts discloses the following:

Re claim 1: A method for forming an electronic device having a multilayer structure, comprising: embossing a surface 2 of a substrate 1, 2 so as to depress first and second regions 12 of the substrate relative to at least a third region of the substrate; applying a "solution" of a conductive or semiconductive material 8 onto the substrate so as to confine in a single step "c)" the deposition of said conductive or semiconductive material to said first and second regions, whereby the conductive or semiconductive material forms a first "electrode" on the first region and a second "electrode" on the second region, wherein the first and second electrodes are inherently electrically insulated from each other by the third region, "This other organic material should have insulating properties."

Re claim 2: A method as claimed in claim 1, wherein the third region has a width defined by a depth to which embossing is performed.

Re claim 6: A method as claimed in claim 1, wherein the third region is a ridge wherein the ridge has a width that defines a "length 1" inherently of a channel of the electronic device.

Re claim 7: A method as claimed in claim 6, wherein a cross section of the ridge is substantially rectangular.

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Re claim 8: A method as claimed in claim 6, wherein a cross section of the ridge is substantially triangular (e.g., a diagonal cross section).

Re claim 11: A method as claimed in claim 1, wherein the substrate comprises a flexible "belt" "mechanical flexibility" "plastic" substrate such as poly(ethyleneterephthalate) (PET), polyethersulphone (PES) or polyethernaphthalene (PEN).

Re claim 27: A method as claimed in claim 1, further comprising the step of depositing a layer of semiconductive "semiconductor" material over the substrate and first and second electrodes "repeat the doctor blade process."

Re claim 30: A method as claimed in claim 27, further comprising the step of depositing a layer of dielectric "insulation" over the layer of semiconductive material.

Re claim 31: A method as claimed in claim 30, wherein the layer of dielectric comprises a polymer layer:

[O]rganic ... [T]he term "organic material" encompassing all types of organic, organometallic and/or inorganic synthetic materials generally referred to in English as e.g. "plastics". This includes all kinds of materials with the exception of the traditional semiconductors (germanium, silicon) and the typical metallic conductors. Any limitation in the dogmatic sense to organic material as carbon-containing material is accordingly not intended. Indeed, consideration is also given to the widespread use of e.g. silicons. Furthermore, the term is not intended to be subject to any limitation to polymer or oligomeric materials, but rather the use of "small molecules" is also entirely conceivable layer.

Re claim 36: A method as claimed in claim 1, wherein the electronic device is a "transistor."

Re claim 37: A method as claimed in claim 1, wherein conductive material is deposited on the substrate which forms "source" and "drain" electrodes of the electronic device.

Re claim 38: A method as claimed in claim 30, wherein the layer of dielectric deposited over the semiconductive layer is a gate dielectric layer.

Re claim 40: A method as claimed in claim 1, wherein the embossing step is performed with a tool 4 having an embossing surface suitable for embossing the substrate, the embossing surface bearing an array of protruding features with sharp tips.

Re claim 43: A method as claimed in claim 40, wherein the protruding features have a rectangular profile.

Re claim 44: A method as claimed in claim 1, wherein the third region has a width of less than 20  $\mu\text{m}$  "less than 10  $\mu\text{m}$ ."

Re claim 45: A method as claimed in claim 1, wherein the third region has a width of less than 5  $\mu\text{m}$ .

Re claim 46: A method as claimed in claim 1, wherein the third region has a width of less than 1  $\mu\text{m}$ .

Re claim 47: A method as claimed in claim 1, wherein the substrate inherently comprises a functional layer of the electronic device, wherein the

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functional layer comprises one of a conducting material and a semiconducting material:

The term "lower layer" as used here refers to any layer of an OFET onto which a layer that is to be patterned is applied. The mold layer from the mold polymer joins up with the "lower layer" or the substrate.

Re claim 123: A method as claimed in claim 1, wherein the first and second electrodes are source and drain electrodes of a transistor.

The following is further clarified:

Re claim 1: so as to confine in a single step "c)" the deposition of said conductive or semiconductive material to said first and second regions.

In particular, in claim 6, Berndt discloses, "the following operating steps," includes the single step, "c) the functional polymer is then introduced into these recesses by means of a doctor blade."

Similarly, Berndt discloses:

The method comprises the following operating steps: ... c) the functional polymer is then introduced by means of a doctor blade into these recesses in liquid form, as a solution and/or as a molten mass.

The following is further clarified:

Re claim 1: the electrodes are inherently electrically insulated from each other by the third region.

As cited, Berndt discloses that the electrodes are inherently insulated from each other by the third region because Berndt discloses, "This other

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organic material should have insulating properties.” In addition, this is an inherent property of the “OFET” of Bernds.

The following is further clarified:

Re claim 6: the ridge has a width that defines a “length 1” inherently of a channel of the electronic device.

Specifically, this is an inherent property of the “OFET” of Bernds.

The following is further clarified:

Re claim 11: such as poly(ethyleneterephthalate) (PET), polyethersulphone (PES) or polyethernaphthalene (PEN).

Specifically, the language, “such as poly(ethyleneterephthalate) (PET), polyethersulphone (PES) or polyethernaphthalene (PEN)” does not limit the scope of the claim to poly(ethyleneterephthalate) (PET), polyethersulphone (PES) or polyethernaphthalene (PEN).

The following is further clarified:

Re claim 38: a gate dielectric layer.

Specifically, Bernds discloses a gate dielectric because the term “gate” merely limits the scope of the term “dielectric” to the intended use of the dielectric and does not appear to result in a structural difference between the claimed dielectric and the dielectric of Bernds. Furthermore, because the dielectric of Bernds appears to have the same structure as the claimed dielectric, it appears to be capable of being used for the intended use and



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the intended use does not patentably distinguish the claimed dielectric from the dielectric of Bernds. The manner in which a product operates is not germane to the issue of patentability of the product; Ex parte Wikdahl 10 USPQ 2d 1546, 1548 (BPAI 1989); Ex parte McCullough 7 USPQ 2d 1889, 1891 (BPAI 1988); In re Finsterwalder 168 USPQ 530 (CCPA 1971); In re Casey 152 USPQ 235, 238 (CCPA 1967). And, claims directed to product must be distinguished from the prior art in terms of structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does [or is intended to do]."

Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). Also, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim."; Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). And, "Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims."; In re Young, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 136 USPQ 458, 459 (CCPA 1963)).

The following is further clarified:

Re claim 40: sharp tips.

Specifically, Bernds discloses sharp tips at least because Bernds discloses tips terminating in an edge, clear in outline or detail, and/or

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distinct; as well as tips inherently adapted to the intended use of cutting or piercing.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berndts as applied to claim 2, and further in combination with Heidari (WO0190816).

As cited, Berndts discloses the following:

Re claim 3: A method as claimed in claim 2, wherein the step of embossing is performed with a tool 4 having an embossing surface, the embossing surface of the tool bearing at least one protruding portion having a sharp protruding tip such that the width of a depressed region of the substrate, as measured in a plane of the surface of the substrate, is dependent on a depth to which the at least one protruding portion of the tool enters into the substrate.

Re claim 4: A method as claimed in claim 2, wherein the step of embossing is performed with a tool having an embossing surface, the embossing surface of the tool bearing at least one recessed portion having a

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recessed point such that a raised region of the substrate has a width, as measured in a plane of the surface of the substrate, is dependent on a depth to which the embossing surface of the tool enters into the substrate.

However, Bernds does not appear to explicitly disclose the following:

Re claim 3: the protruding portion has a width that widens from the sharp protruding tip, towards the embossing surface of the tool.

Re claim 4: the recessed portion has a width that widens from the recessed point, towards the embossing surface of the tool.

Nonetheless, in the specification, page 1, line 5 to page 2, line 14; page 3, lines 29-36; page 4 line 31 to page 5, line 7; and page 5, line 35 to page 7, line 2; and page 7, lines 13-30, Heidari discloses the protruding portion 3c/8 has a width that widens from the sharp protruding tip, towards the embossing surface of the tool 1, 3c/8; the recessed portion (between each 3c/8) has a width that widens from the recessed point, towards the embossing surface of the tool.

Moreover, it would have been obvious to combine this disclosure of Heidari with the disclosure of Bernds because, as disclosed by Heidari, it would provide a profile beneficial for separation from the embossed surface.

Incidentally, it is noted that in the combination of Heidari and Bernds, Heidari also discloses sharp tips 3c.

Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernds as applied to claim 1, and further in combination with Ostergard (20030230747).

As cited, Bernds discloses the following:

Re claim 12: A method as claimed in claim 1, wherein the substrate comprises a substrate coated with a polymer layer 2.

However, Bernds does not appear to explicitly disclose the following:

Re claim 5: wherein after the step of embossing and prior to the step of depositing a solution of conductive or semiconductive material, the method further comprises the step of: treating the surface of the substrate with a surface modification process that has a different effect on depressed regions of the substrate relative to the non-depressed regions of the substrate whereby the non-depressed regions and the depressed regions are given different surface energies, such that the deposition of the material is defined by the surface energy of the substrate in the first and second regions.

Nevertheless, at paragraphs 5, 6, 11, 13, 19, 44, 45, 51; and claim 7, Ostergard discloses prior to the step of depositing a solution of conductive or semiconductive material "semiconducting material," the method further comprises the step of: treating the surface of the substrate "surface treating the substrate" with a surface modification process that has a different effect

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on regions of the substrate relative to other regions of the substrate whereby the regions and the other regions are given different surface energies, such that the deposition of the material is defined by the surface energy of the substrate in the first and second regions "The surface tension of the ink-jet droplet on the various regions will thus define the spreading of the droplet."

Furthermore, it would have been obvious to combine this disclosure of Ostergard with the disclosure of Berndt because it would facilitate the material deposition and patterning of Berndt. Indeed, it has been held that it is obvious to combine two processes for the same purpose. In *re Novak* 16 USPQ2d 2043. Similarly, "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose . . . . [T]he idea of combining them flows logically from their having been individually taught in the prior art." In *re Kerkhoven*, 626 F.2d 846, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted) (Claims to a process of preparing a spray - dried detergent by mixing together two conventional spray - dried detergents were held to be prima facie obvious.). See also, In *re Crockett*, 279 F.2d 274, 126 USPQ 186 (CCPA 1960) (Claims directed to a method and material for treating cast iron using a mixture comprising calcium carbide and magnesium oxide were held unpatentable

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over prior art disclosures that the aforementioned components individually promote the formation of a nodular structure in cast iron.); and Ex parte Quadranti 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992) (Mixture of two known herbicides held prima facie obvious).

In addition, as cited, Berndts discloses using a substrate with pre-defined patterns in the substrate surface for receiving organic semiconducting material and organic conductive circuits. Furthermore, as cited, Ostergard discloses that using a substrate with pre-defined patterns in the substrate surface for receiving organic semiconducting material and organic conductive circuits, and substrate surface treatment, are alternatives and equivalents. Therefore, as reasoned from well established legal precedent, it would have been obvious to combine the substrate surface treatment of Ostergard with the material deposition and patterning of Berndts. See In re May (CCPA) 136 USPQ 208 (It is our opinion that the substitution of Wille's type seal for the cement of Hallauer in Figure 1 would be obvious to persons of ordinary skill in the art from the disclosures of these references, merely involving an obvious selection between known alternatives in the art and the application of routine technical skills.); In re Cornish (CCPA) 125 USPQ 413; In re Soucy (CCPA) 153 USPQ 816; Sabel et al. v. The Wickes Corporation et al. (DC SC) 175 USPQ 3; Ex parte Seiko Koko Kabushiki Kaisha Co. (BdPatApp&Int) 225 USPQ 1260; and Ex parte

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Rachlin (BdPatApp&Int) 151 USPQ 56. See also Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980) (However, there was evidence that both phthalocyanine and selenium were known photoconductors in the art of electrophotography. "This, in our view, presents strong evidence of obviousness in substituting one for the other in an electrophotographic environment as a photoconductor." 209 USPQ at 759.). An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted). See also In re Crockett, 279 F.2d 274, 126 USPQ 186 (CCPA 1960); Ex parte Quadranti, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992).

It would also have been obvious to combine the substrate surface treatment of Ostergard with the material deposition and patterning of Bernds because the combination of one known alternative element with another would have yielded predictable results to one of ordinary skill in the art at the time of the invention; and, "a person of ordinary skill in the art

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has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.” KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007).

Also, Bernds does not appear to explicitly disclose the following:

Re claim 12: a rigid substrate.

Regardless, as cited, Bernds discloses a flexible substrate.

Furthermore, as cited, Ostergard discloses that a “flexible” and “rigid” substrate are alternatives and equivalents. Therefore, as reasoned from well established legal precedent, it would have been obvious to substitute or combine the rigid substrate of Ostergard for or with the flexible substrate of Bernds.

It would also have been obvious to substitute or combine the rigid substrate of Ostergard for or with the flexible substrate of Bernds because the substitution of or combination with one known alternative element for or with another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Claims 24, 28, 32 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernds as applied to claim 30, and further in combination with Ong (20030164495).

Bernds does not appear to explicitly disclose the following:



Re claim 24: A method as claimed in claim 23, wherein the conductive polymer is polyethylenedioxythiophene doped with polystyrene sulfonic acid (PEDOT/PSS).

Re claim 28: A method as claimed in claim 27, wherein the semiconductive material formed over the substrate and first and second electrodes is regioregular poly(3-hexylthiophene) (P3HT) or poly(dioctylfluorene-co-bithiophene) (F8T2).

Re claim 32: A method as claimed in claim 31, wherein the polymer layer is poly(methylmethacrylate) (PMMA).

Re claim 39: A method as claimed in claim 38, further comprising the step of depositing a gate electrode onto the surface of the gate dielectric layer.

Still, at paragraphs 8-27, 33-36 and 47; and claim 11, Ong discloses wherein a conductive polymer is polyethylenedioxythiophene doped with polystyrene sulfonic acid (PEDOT/PSS) "polystyrene sulfonate-doped poly(3,4-ethylenedioxythiophene)"; wherein a semiconductive material is regioregular poly(3-hexylthiophene) ("P3HT"); wherein a polymer layer is poly(methylmethacrylate) (PMMA) "poly(methacrylate)."

In addition, it would have been obvious to combine this disclosure of Ong with the disclosure of Berndts because it would facilitate provision of the conductive polymer, material and polymer layer of Berndts.

Also, as cited, Ong discloses a step of depositing a gate electrode 78 onto the surface of a gate dielectric layer 74.

Furthermore, it would have been obvious to combine this disclosure of Ong with the disclosure of Berndts because it would facilitate the manufacture of the OFET of Berndts.

Claims 9, 10, 22, 23, 25, 29 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berndts as applied to claim 27, and further in combination with Bulthaup (20030082485).

As cited, Berndts discloses the following:

Re claim 9: A method as claimed in claim 1, wherein the embossing step inherently is performed at a temperature of a topmost surface of the substrate.

Re claim 10: A method as claimed in claim 1, wherein the embossing step inherently is performed at a temperature at which a topmost surface of the substrate is in a phase.

Re claim 22: A method as claimed in claim 1, wherein the solution of conductive or semiconductive material comprises a conductive material.

Re claim 23: A method as claimed in claim 22, wherein the conductive material comprises a conductive polymer.

However, Berndts does not appear to explicitly disclose the following:

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Re claim 9: the embossing step is performed at a temperature within 50 °C of the glass transition temperature of a topmost surface of the substrate.

Re claim 10: the embossing step is performed at a temperature at which a topmost surface of the substrate is in a liquid phase.

Re claim 22: the solution of conductive or semiconductive material comprises a conductive ink.

Re claim 23: the conductive ink comprises a conductive polymer.

Re claim 25: the conductive ink comprises a conductive inorganic dispersion of electrically conductive nanoparticles.

Re claim 29: the semiconductive material formed over the substrate and first and second electrodes is an inorganic nanoparticulate or an inorganic nanowire semiconductor.

Notwithstanding, at paragraphs 8, 30, 32-35 and 45, Bulthaup discloses the embossing "embossed" step inherently is performed at a temperature within 50 °C of the glass transition temperature of a topmost surface of the substrate 103; the embossing step inherently is performed at a temperature at which the topmost surface of the substrate is in a "liquid" phase; the solution of conductive or semiconductive material comprises a conductive ink; the conductive ink comprises a conductive polymer; the conductive ink comprises a conductive inorganic dispersion of electrically

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conductive nanoparticles; a semiconductive material "first material" is an inorganic nanoparticulate or an inorganic nanowire semiconductor.

To further clarify, as cited, Bulthaup discloses that the topmost surface is a liquid; therefore, it is inherent that the embossing step inherently is performed at a temperature within 50 °C of the glass transition temperature of the topmost surface.

To further clarify, Bulthaup discloses a semiconductive material is an inorganic nanoparticulate because Bulthaup discloses:

The first material can also be a nano-particle solution comprising nano-particles of ... semiconductors (such as CdS, CdSe, Si, Ge, or GaAs) ... Applications for nano-particle solutions and their preparation are described in ... U.S. Pat. No. 6,294,401, ... incorporated by reference.

Additionally, at column 6, lines 11-34, 6,294,401, Bulthaup discloses, "a CdSe (or other semiconductors, such as CdS, CdTe, or Si) nanoparticle dispersion is used to form [semiconductive] layer 125."

Moreover, it would have been obvious to combine this disclosure of Bulthaup with the disclosure of Berndts because it would facilitate the provision of the semiconductive material of Berndts.

Further, in the combination of Berndts and Bulthaup, as cited, Berndts discloses the following:

Re claim 33: A method as claimed in claim 29, further comprising the step of printing a pattern of conductive material to form an electrode for said electronic device.

Re claim 34: A method as claimed in claim 33, wherein the electrode is formed from a conductive polymer or an inorganic material.

Re claim 35: A method as claimed claim 29, wherein both the semiconductor layer and the dielectric layer are inherently patterned so as to form an active layer island of the device.

The following is further clarified:

Re claim 35: A method as claimed claim 29, wherein both the semiconductor layer and the dielectric layer are inherently patterned so as to form an active layer island of the device.

Specifically, the semiconductor layer and the dielectric layer are inherently patterned so as to form an active layer island of the device because, as disclosed by Berndt, as cited, the semiconductor layer is an inherently active layer and the semiconductor and dielectric layers are patterned at least "between and over at least a source and at least a drain electrode," and, "over the semiconducting layer," respectively. Furthermore, the active layer patterned at least "between and over at least a source and at least a drain electrode," inherently forms an active layer island.

The applied prior art does not appear to disclose the limitations of claims 17-21.

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Applicant's remarks filed on 3-11-09 have been fully considered, treated supra, addressed infra, and/or adequately addressed previously of record.

Applicant states:

For example, Figure 5A shows a ridge (labelled 43) which defines a channel in between the electrodes (labelled 44 and 45) in a semiconductor material (labelled as 46).

This statement is respectfully traversed because Figure 5a does is not drawn to the embodiment of claim 6 comprising embossing a surface of a substrate so as to depress first and second regions of the substrate relative to at least a third region of the substrate, wherein the first and second electrodes are electrically insulated from each other by the third region.

Also, applicant asserts:

Claim 1 has been amended on the basis of Figures 1A-1G of the current application and the associated written description at sections [0026] and [0027] of the US publication for this application. In particular, the verb "confine" is used at the first line of section [0027].

These assertions are respectfully traversed because the verb "confine" is not used at the first line of section [0037].

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions relevant to the examination of the instant invention.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**For information on the status of this application applicant should check PAIR:**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Alternatively, applicant may contact the File Information Unit at (703) 308-2733. Telephone status inquiries should not be directed to the examiner. See MPEP 1730VIC, MPEP 203.08 and MPEP 102.**

Any other telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (571) 272-1930. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is (571) 273-8300.

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/David E Graybill/  
Primary Examiner, Art Unit 2894